



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/539,938

06/17/2005

Reiner Anton

2002P08684WOUS

6840

28524

7590

03/30/2009

SIEMENS CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
170 WOOD AVENUE SOUTH  
ISELIN, NJ 08830

EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/30/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,938	<b>Applicant(s)</b> ANTON ET AL.	
	<b>Examiner</b> WILLIAM T. LEADER	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/17/05; 10/24/07</u> .                                       | 6) <input type="checkbox"/> Other: ____.                          |

### **DETAILED ACTION**

1. In the preliminary amendment filed on June 17, 2005, applicant canceled claims 1-9 and submitted claims 10-20. Claims 10-20 are pending.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In claim 10, line 1 it appears that a connecting word such as “comprising” or “consisting of” is missing after “alloy”.

5. Claim 10, line 3 recites arranging the alloy in an electrolyte. This limitation seems incompatible with applicant's disclosed process since the alloy is formed by deposition onto on a substrate (numbered 13 in figure 1) which is placed in the electrolyte. It appears to be the substrate that is arranged in the electrolyte (numbered 7 in figure 1).

6. Claim 10, lines 3-4 recite “the at least two constituents of the alloy are suspended and/or dissolved” but do not state in what they are suspended or dissolved. This is unclear.

7. Claim 10, line 7 recites “adapting one block in each case”. The meaning of “in each case” is not clear.

8. Claim 10, lines 8-9 recite adapting to “achieve optimum deposition of the constituent.”

The scope of this limitation is not clear since it is not apparent what parameters related to the deposition of the constituent are optimized, or how it is determined when they have reached an optimum value. For example, deposition speed, absence of hydrogen gas evolution, surface smoothness or roughness, and deposit hardness are representative of a plurality of parameters that could be optimized.

9. Claim 10, line 8 recites “a block comprising two or more voltage pulses”. The expression “a block” is singular. It is not clear if “a block” refers to only one block in total, or to one block for each constituent.

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 10-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

12. As noted above, claim 10 was presented in a preliminary amendment. The limitation recited in the last paragraph that a first block of a sequence is followed by a second block in the same sequence of the same polarity does not appear to have been described in the specification as filed.

***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 10, 13, 14, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Nee et al (US 4,869,971).

14. The Nee et al patent is directed to an electrolytic deposition process for forming an alloy deposit of at least two constituents as a multilayer deposit on a substrate. The multilayer deposit comprises a sequence of essentially repeating groups of layers. Each group of layers includes a layer of a first electrodeposited material and a layer of a second electrodeposited material. The first and second electrodeposited materials are distinct materials (abstract; column 2, lines 34-40).

15. As described in the abstract, the process includes the steps of immersing the substrate in an electrodeposition bath and repeatedly passing a charge burst of a first electric current and a second electric current through the electrodeposition bath to the substrate. The first electric current is a pulsed current with a first pulsed-on/off waveform and a first peak current density which is effective to electrodeposit the first electrodeposited material. The second electric current has a second waveform and a second current density which is effective to electrodeposit the second electrodeposited material. See the abstract. A diagram of the applied electric current is shown in figures 1A and 1B. The layers may be distinct from one another in terms of chemical composition, crystal structure, crystal grain size, morphology or other property (column

3, lines 4-10). Figure 3 shows the weight percent copper content of an electrodeposited brass alloy versus average current density for electrodeposition currents.

16. In example 1, an electrolyte solution was prepared by dissolving copper cyanide and zinc cyanide in distilled water. A substrate in the form of a sheet was immersed in the electrolyte (column 7, lines 10-43). This corresponds to the first step recited in applicant's claim 10. A repeating sequence of pairs of charge bursts of pulsed current was applied to the substrate to deposit repeating groups of layers (column 7, line 44 to column 8, line 25). This corresponds to the second and third steps of claim 10.

17. With respect to claim 13, a current/voltage pulse which is defined by a time profile as shown in figures 1A and 1B is used by Nee for the electrolytic deposition.

18. With respect to claim 14, the current/voltage pulse used by Nee may be a square-wave as shown in figure 1B.

19. With respect to claim 16, as shown by figures 1A and 1B a number of pulses defines a block.

20. With respect to claim 18, Nee teaches that the layers may be distinct from one another in terms of chemical composition (column 3, lines 7-9), and shows in figure 3 the variation of copper content in a deposited brass alloy with changes in average current density.

### ***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

23. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nee et al (US 4,869,971) in view of GB1521130.

24. Nee et al is interpreted as above. Claims 11 and 12 differ from the process of Nee et al by reciting imparting mechanical vibrations and the use of an ultrasound probe. As described in the abstract, the GB '103 patent is directed to electroplating, and applies ultrasonic radiation to the workpiece immersed in a plating bath from a piezo-electric transducer. The patent teaches that the rate of plating is usually limited by the diffusion rate of ions. The diffusion of ions may be increased by agitation of the electrolyte. A known method of providing this agitation is to irradiate the workpiece and surrounding electrolyte by ultrasonic radiation (page 1, lines 30-40). The ultrasonic radiation of the invention is effective to locally agitate the electrolyte (page 1, lines 54-64). The piezo-electric transducer is an ultrasound probe.

25. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious to have provided ultrasonic agitation using an ultrasound probe in the process of Nee as taught by GB '130 because the diffusion rate of ions would have been increased.

26. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nee et al (US 4,869,971) in view of Taylor et al (US 6,319,384).

27. Nee et al is interpreted as above. Claim 15 differs from the process of Nee et al by reciting the use of negative as well as positive current/voltage pulses. The Taylor et al patent is directed to electrolytic deposition of a smooth layer of a metal or alloy. Alloys may include brass (abstract; claim 15). Taylor employs a pulse waveform such as that illustrated in figure 1 which includes both positive and negative pulses. The cathodic pulse causes deposition to occur. The anodic pulse preferentially removes deposited metal from microscopic peaks and convexities of the substrate. Accordingly, the excess metal that may have been deposited during the cathodic pulse tends to be removed by the anodic pulse. See column 10, lines 20-37. It would have been obvious at the time the invention was made to have included both positive and negative pulses as taught by Taylor et al because a smoother deposit would have been obtained.

28. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nee et al (US 4,869,971) in view of Foster et al (GB 2 167 446A).



29. Claim 17 recites that an MCrAlY layer is deposited as an alloy with M being iron, cobalt or nickel. The Foster et al patent is directed to an electrodeposited composite coating having a composition  $M_1CrAlM_2$  where  $M_1$  is iron, cobalt or nickel and  $M_2$  is Y, Si, Ti or a rare earth element. See the abstract. The coating provides protection of substrates intended to operate in hostile environments by providing improved resistance to one or more of oxidation, corrosion and erosion. See page 1, lines 5-9. It would have been obvious at the time the invention was made to have utilized the process of Nee et al to have formed a MCrAlY coating because this type of coating is known to provide improved protection of substrate as taught by Foster et al.

30. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nee et al (US 4,869,971) in view of Lashmore (US 4,461,680).

31. Claims 19 and 20 recite that a base current is superimposed. The Lashmore patent is directed to a process for electroplating nickel-chromium alloys. The electroplating is carried out using pulsed current. An example of the pulsed current is shown in figure 1. As shown in figure 1, the base current may be zero, or a current indicated by the dashed line may be superimposed. See column 1, lines 40-44 which indicate that a zero base current or a superimposed base current are alternatives. It would have been obvious at the time the invention was made to have used a superimposed current rather than a zero base current in the process of Nee et al because it is known to superimpose a base current in the deposition of an alloy coating and they are shown to be equivalents by Lashmore.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Leader/  
March 24, 2009

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795